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August 7, 1957

Dear Sir:

This is the first letter report on the extension of Task Order No. C and it describes the activity during the period from June 28 to August 1, 1957.

This project involves Phase II of a research program directed toward the development of a prototype hydrogen generator. Phase I, conducted under Task Order No. C, was devoted to relatively small-scale studies of the requirements for an experimental hydrogen generator capable of generating enough hydrogen to provide 250 pounds of lift at sea level (about 3,500 cubic feet of hydrogen) over a period of 45 to 60 minutes. Phase I included a literature search, an analysis of the most desirable systems compatible with the Sponsor's specifications for the generator of interest, a laboratory investigation of the characteristics of the hydrogen-generating reaction, and the preliminary design of an experimental full-scale hydrogen generator.

The objective of Phase II is to develop and evaluate a prototype full-scale (about 3,500 cubic feet) hydrogen generator. In view of the high cost of the basic chemical (sodium borohydride), the evaluation portion of this program will include a series of 1/5-scale studies and then two or three full-scale studies.

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During July, the design of the 1/5-scale experimental hydrogen generator was completed. The order for this unit was placed with the manufacturer, and delivery is expected in October, 1957. The design of the full-scale generator will be completed after tests have been concluded on the 1/5-scale hydrogen generator.

The hydrogen-generator design as outlined under Phase I was modified to meet additional requirements resulting from further consideration of the experimental data and from suggestions by the manufacturer. A rough-draft drawing of the 1/5-scale unit is enclosed.

The 1/5-scale hydrogen generator, which is approximately 43 inches in diameter and 33 inches high, will be made from neoprene-coated nylon fabric, approximately 0.020 inch thick. The generator will be supported in the water by a pneumatic structure of 3-inch airmat fabric which is inflated with the use of a hand pump. Access ports are provided by three gas-tight brass zippers. The generator is designed to withstand a maximum pressure of 0.4 psig and a maximum temperature of 165 F.

Work for August will involve contact with the manufacturer to expedite the satisfactory completion and delivery of the 1/5-scale generator.

The expenditures for the month of July were not available for inclusion in this report. They will be indicated in the next monthly letter report.

Sincerely,



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